

17. (amended) The method of claim 1, wherein [said] a stromal support matrix comprises fibroblasts.

21. (amended) The method of claim 20, [wherein the] using a biocompatible inner lining [is employed] in heart valves, heart implants, dialysis equipment, or oxygenator tubing for heart-lung by-pass systems.

22. (amended) The method of claim 1, which includes the step of [incorporating] introducing a drug into said biomaterial [thereby decreasing the need for systemic intravenous or oral medications].

23. (amended) A method for using a[n] tropoelastin biomaterial as a tissue-fusible layer, comprising:

providing a layer of tropoelastin biomaterial having a first and second outer major surface [which is] which is useable as a tissue-fusible material;

providing a tissue substrate having a first and second outer major surface; and

applying an energy absorbing material, which is energy absorptive within a predetermined range of light wavelengths, to one of said first and second outer surfaces of the tropoelastin biomaterial in an amount which will make said tropoelastin biomaterial tissue-fusible, and which will cause fusing together of one of said first and second outer surfaces of the tropoelastin biomaterial and one of said first and second outer surfaces of said tissue substrate, said energy absorbing material

Substantive
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[penetrating] being applied so that it will penetrate into the interstices of said tropoelastin biomaterial[;].

irradiating the energy absorbing material with light energy in said predetermined wavelength range with an intensity being sufficient to fuse together one of said first and second outer surfaces of the tropoelastin biomaterial and the tissue substrate[; and

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fusing together one of said first and second outer surfaces of the tropoelastin biomaterial and the tissue substrate].

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24. (amended) A method for producing an tropoelastin biomaterial fused onto a tissue substrate comprising:

providing a layer of tropoelastin biomaterial having a first and second outer major surface and a tissue substrate having a first and second outer major surface; [and]

applying an energy absorbing material, which is energy absorptive within a predetermined range of light wavelengths, to one of said first and second outer surfaces of the tropoelastin biomaterial in an amount which will cause fusing together of one of said first and second outer surfaces of the tropoelastin biomaterial and one of said outer surface of said tissue substrate, said energy absorbing material penetrating into the interstices of said tropoelastin biomaterial;

indirectly irradiating the energy absorbing material by directing the light energy first through the tropoelastin biomaterial or tissue substrate and then to the energy absorbing

material, said light energy being in said predetermined wavelength range with an intensity sufficient to fuse together one of said first and second outer surfaces of the crosslinked tropoelastin biomaterial and the outer surface of said tissue substrate; and

fusing together one of said first and second outer surfaces of the crosslinked tropoelastin biomaterial and the outer surface of said tissue substrate[1] and substantially dissipating said energy absorbing material when said crosslinked tropoelastin biomaterial and said tissue substrate are fused together.

36. (amended) A method for producing a prosthetic device comprising:

providing a layer consisting essentially of tropoelastin biomaterial and a support member comprising a stent, a conduit or a scaffold; and

applying said layer of consisting essentially of tropoelastin biomaterial to said support member to form said prosthetic device.

41. (amended) The method of claim 36, which includes the step of forming said tropoelastin biomaterial into a sheet or tube, and then covering said support member with said sheet or tube.

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44. (amended) The method of claim [37] 36, which includes the step of attaching said sheet to said support by laser bonding.

45. (amended) The method of claim [367] 36, which includes the step of incorporating a drug into said layer of tropoelastin material thereby decreasing the need for systemic intravenous or oral medications.

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47. (amended) A method for producing a tropoelastin biomaterial, which comprises:

providing a [tropoelastin] monomer consisting essentially of tropoelastin;

polymerizing said tropoelastin monomer to form a [tropoelastin] polymer consisting essentially of tropoelastin; and

forming a biocompatible tropoelastin biomaterial from said tropoelastin polymer [for use in biomedical applications].

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48. (amended) The method of claim 47, which further includes the further step of [employing] using the biocompatible tropoelastin biomaterial [for use] in replacement or repair of bladders, intestines, tubes, esophagus, ureters, arteries, veins, stomachs, lungs, hearts, colons, skin, or as a cosmetic implantation.

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50. (amended) The method of claim 47, wherein [said] a stromal support matrix comprise fibroblasts.

Sub F4
Sub 51. (amended) The method of claim 47, which further includes the step of forming a cellular lining of human cells on one of the major surfaces of [said] a tropoelastin layer.

52. (amended) The method of claim 47, wherein [said] a cells which are employed to form such a lining are at least one of endothelial cells, epithelial cells and urothelial cells.

Sub 53
53. (amended) The method of claim 47, which further includes the step of forming a[n] tropoelastin biocompatible inner lining for mechanical human structures to ensure their continued internal use in a human body.

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54. (amended) The method of claim 47, [wherein the] which includes the further step of using a biocompatible inner lining [is employed] in heart valves, heart implants, dialysis equipment, or oxygenator tubing for heart-lung by-pass systems.

55. (amended) The method of claim 47, which includes the step of [incorporating] introducing a drug into said biomaterial [thereby decreasing the need for systemic intravenous or oral medications].

Sub F5
74. (amended) A method for producing a [tropoelastin] biomaterial consisting essentially of tropoelastin capable of being fused onto a tissue substrate comprising:

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providing a layer of [tropoelastin] biomaterial consisting essentially of tropoelastin having a first and second outer major surface; and

applying an energy absorbing material, which is energy absorptive within a predetermined range of light wavelengths, to a selected one of said first and second outer surfaces of the tropoelastin biomaterial in an amount which will cause fusing together of one of said first and second outer surfaces of the tropoelastin biomaterial and an outer surface of said tissue substrate, said energy absorbing material penetrating into the interstices of said tropoelastin biomaterial,

the selected one of said first and second outer surfaces of the tropoelastin biomaterial being capable of fusing together with the outer surface of the tissue substrate by irradiating the energy absorbing material with light energy in a predetermined wavelength range with an intensity sufficient to facilitate said fusing together.

Add the following new claims 76-99:

--76. A method for producing a biomaterial consisting essential of tropoelastin fused onto a tissue substrate comprising:

providing a layer of a biomaterial consisting essential of tropoelastin having a first and second outer major surface and a tissue substrate having a first and second outer major surface; and

applying an energy absorbing material, which is energy absorptive within a predetermined range of light wavelengths, to a selected one of said first and second outer surfaces of the

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tropoelastin biomaterial in an amount which will cause fusing together of one of said first and second outer surfaces of the tropoelastin biomaterial and one of said first and second outer surfaces of said tissue substrate, said energy absorbing material penetrating into the interstices of said tropoelastin biomaterial;

irradiating the energy absorbing material with light energy in said predetermined wavelength range with an intensity sufficient to fuse together one of said first and second outer surfaces of the tropoelastin biomaterial and the tissue substrate; and

fusing together the selected one of said first and second outer surfaces of the tropoelastin biomaterial and the tissue substrate.--

--77. The method of claim 76, which further includes the step of indirectly irradiating said energy absorbing material by directing the light energy first through the tropoelastin biomaterial or tissue substrate and then to the energy absorbing material.--

--78. The method of claim 76, wherein said energy absorbing Material comprises a biocompatible chromophore.

--79. The method of claim 76, wherein said energy absorbing material comprises an energy absorbing dye.--

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--80. The method of claim 76, which further includes the step of substantially dissipating said energy absorbing material when said tropoelastin biomaterial and said tissue substrate are fused together.--

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--81. The method of claim 76, which further includes the step of staining the first or second surface of said tropoelastin biomaterial with said energy absorbing material.--

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--82. The method of claim 76, which further includes the step of applying said energy absorbing material to one of said outer surfaces of said biomaterial by doping a separate tropoelastin layer with an energy absorbing material, and then fusing the doped separate tropoelastin layer to the tropoelastin biomaterial.--

--83. The method of claim 76, wherein the energy absorbing layer is substantially uniformly applied to a selected one of said first and second outer surfaces of the tropoelastin biomaterial.--

--84. The method of claim 76, which further includes the step of covering substantially the entire outer surface of the tropoelastin biomaterial with the energy absorbing material.--

--85. The method of claim 76, which further includes the step of irradiating the energy absorbing material with light energy at a localized temperature of from about 40 to 600 degrees C. for period of time sufficient to cause fusing together of one of said first and second outer surfaces of the tropoelastin

biomaterial and one of said first and second outer surfaces of said tissue substrate.--

--86. The method of claim 76, wherein the tissue substrate is a live tissue substrate.--

--87. The method of claim 76, wherein the average thickness of the energy absorbing material which penetrates into the interstices of the tropoelastin biomaterial is from about 0.5 to 300 microns.--

--88. The method of claim 76, which further includes the step of arranging the magnitude of the wave length, energy level, absorption, and light intensity during irradiation with light energy of the energy absorbing material, and the concentration of the energy absorbing material, so that the localized temperature at the interface of said first and second outer surfaces of the tropoelastin biomaterial and the tissue substrate are maintained at from about 40 to 600 °C., thereby fusing together the tropoelastin biomaterial and the tissue substrate.--

--89. The method of claim 76, wherein the tissue substrate so that the tissue substrate is a live tissue substrate.--

--90. The method of claim 76, which further includes the step of using tropoelastin material for replacement or repair of bladders, intestines, tubes, esophagus, ureters, arteries, veins, stomachs, lungs, hearts, colons, skin, or as a cosmetic implantation.--

~~Sub 81~~ --91. The method of claim 76, which further includes the step of forming an tropoelastin into a three-dimensional support structure wherein said tropoelastin material is combined with a stromal support matrix populated with actively growing stromal cells.--

Sub F6
Sub E04
--92. The method of claim 76, wherein a stromal support matrix comprises fibroblasts.--

--93. The method of claim 76, which further includes the step of forming a cellular lining of human cells on one of the major surfaces of said tropoelastin layer.--

~~Sub 86~~ --94. The method of claim 76, wherein said cells which are employed to form such a lining are at least one of endothelial cells, epithelial cells and urothelial cells.--

Sub E05
--95. The method of claim 76, which further includes the step of forming an tropoelastin biocompatible inner lining for mechanical human structures to ensure their continued internal use in a human body.--

~~Sub 89~~ --96. The method of claim 20, using a biocompatible inner lining in heart valves, heart implants, dialysis equipment, or oxygenator tubing for heart-lung by-pass systems.--

--97. The method of claim 76, which includes the step of introducing a drug into said biomaterial.--

~~Sub 12~~ --98. A method for using a tropoelastin biomaterial as a tissue-fusible layer, comprising:

Sub-Process
 providing a layer of tropoelastin biomaterial having a first and second outer major surface [which is] which is useable as a tissue-fusible material;

Sub-File
 providing a tissue substrate having a first and second outer major surface; and

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 applying an energy absorbing material, which is energy absorptive within a predetermined range of light wavelengths, to one of said first and second outer surfaces of the tropoelastin biomaterial in an amount which will make said tropoelastin biomaterial tissue-fusible, and which will cause fusing together of one of said first and second outer surfaces of the tropoelastin biomaterial and one of said first and second outer surfaces of said tissue substrate, said energy absorbing material [penetrating] being applied so that it will penetrate into the interstices of said tropoelastin biomaterial,

irradiating the energy absorbing material with light energy in said predetermined wavelength range with an intensity being sufficient to fuse together one of said first and second outer surfaces of the tropoelastin biomaterial and the tissue substrate.--

--99. A method for producing an tropoelastin biomaterial fused onto a tissue substrate comprising:

providing a layer of tropoelastin biomaterial having a first and second outer major surface and a tissue substrate having a first and second outer major surface;

~~Sub-Process~~
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applying an energy absorbing material, which is energy absorptive within a predetermined range of light wavelengths, to one of said first and second outer surfaces of the tropoelastin biomaterial in an amount which will cause fusing together of one of said first and second outer surfaces of the tropoelastin biomaterial and one of said outer surface of said tissue substrate, said energy absorbing material penetrating into the interstices of said tropoelastin biomaterial;

indirectly irradiating the energy absorbing material by directing the light energy first through the tropoelastin biomaterial or tissue substrate and then to the energy absorbing material, said light energy being in said predetermined wavelength range with an intensity sufficient to fuse together one of said first and second outer surfaces of the crosslinked tropoelastin biomaterial and the outer surface of said tissue substrate; and

fusing together one of said first and second outer surfaces of the crosslinked tropoelastin biomaterial and the outer surface of said tissue substrate and substantially dissipating said energy absorbing material when said crosslinked tropoelastin biomaterial and said tissue substrate are fused together.--